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To the Proprietors of the Belfast Magazine.

HAVING seen in the Newry Telegraph of the 12th inst. some animadversions on my "Remarks occasioned by reading a sermon, entitled, 'The Times,' by S. Edgar" as published in your Magazine for May last, I may briefly state, that nothing contained therein appears to me to possess sufficient weight to induce me to alter my sentiments respecting the discourse in question, or to convince either me or any one else that my remarks are erroneous. Indeed why should it? The author uses no argument; it is chiefly ridicule. He ridicules my style, and what he is pleased to call my

criticism. I aim not at high sounding language; nor do I pretend to any degree of proficiency in the exact rules of nice criticism; my wish is simply to state my sentiments, and leave to others to form what opinion they please respecting them.

The "Sermon" and my "Remarks" are now before the public. Let the voice of impartiality judge of the fitness or deficiency of the latter in point of accuracy, and touching the former, whether a free discussion, conducted on the principles of sound reasoning and calm inquiry, would bear the author out in all the propositions he has advanced.

N.S.

BIOGRAPHICAL SKETCHES OF DISTINGUISHED PERSONS.

ACCOUNT OF JAMES BRINDLEY, A SELF-INSTRUCTED GENIUS, AND INTRODUCER OF THE MODE OF STILL WATER NAVIGATION.

THE following account is extracted from Dr. Aiken's History of Manchester and its environs. It exhibits in a striking point of view, the energies of a vigorous mind, directed by accidental circumstances to a particular pursuit, and probably the more strengthened by being forced to encounter the difficulties of an unfavourable situation. Genius consists more in attention and industry applied to a certain point, than in any intuitive bent, as the wonder-mongers choose to define it. The same application differently directed, would have made the subject of this memoir equally conspicuous in a very opposite line. The intention in selecting for republi-

cation, the present relation is to stimulate youthful minds to a full exertion of their powers by affording demonstrative evidence that no situation is so unfavourable that it may not be overcome by patient industry. The aim is also to warn against the notion often so destructive of perseverance, that genius must be born, and cannot be acquired.

James Brindley was born at Tunsted in the parish of Wormhill, Derbyshire, in 1716. His father was a small freeholder, who dissipated his property in company and field-amusements, and neglected his family. In consequence, young Brindley was left destitute of even the common rudiments of education, and till the age of seventeen was casually employed in rustic labours. At that period he bound himself apprentice to one Bennet, a mill-

wright, at Macclesfield, in Cheshire, where his mechanical genius presently developed itself. The master being frequently absent, the apprentice was often left for weeks together to finish pieces of work concerning which he had received no instruction; and Bennet on his return was often greatly astonished to see improvements in various parts of mechanism of which he had no previous conception. It was not long before the millers discovered Brindley's merits, and preferred him in the execution of their orders to the master or any other workman. At the expiration of his servitude, Bennet being grown into years, he took the management of the business upon himself; and by his skill and industry contributed to support his old master and his family in a comfortable manner.

In process of time, Brindley set up as a mill-wright on his own account, and by a number of new and ingenious contrivances greatly improved that branch of mechanics, and acquired a high reputation in the neighbourhood. His fame extending to a wider circle, he was employed in 1752 to erect a water-engine at Clifton, in Lancashire, for the purpose of draining some coal-mines. Here he gave an essay of his abilities in a kind of work for which he was afterwards so much distinguished, driving a tunnel under ground through a rock nearly 600 yards in length, by which water was brought out of the Irwell for the purpose of turning a wheel fixed thirty feet below the surface of the earth. In 1755 he was employed to execute the large wheels for a silk mill at Congleton; and another person, who was engaged to make other parts of the machinery, and to superintend the whole proving incapable of completing the work, the business was entirely

committed to Brindley; who not only executed the original plan in a masterly manner, but made the addition of many curious and valuable improvements, as well in the construction of the engine itself, as in the method of making the wheels and pinions belonging to it. About this time, too, the mills for grinding flints in the Staffordshire potteries received various useful improvements from his ingenuity.

In the year 1756 he undertook to erect a steam-engine upon a new plan at Newcastle-under-Line; and he was for a time very intent upon a variety of contrivances for improving this useful piece of mechanism. But from these designs he was, happily for the public, called away to take the lead in what the event has proved to be a nation concern of capital importance—the projecting the system of canal navigation. The duke of Bridgewater, who had formed his design of carrying a canal from his coal-works at Worsley to Manchester, was induced by the reputation of Mr. Brindley to consult him on the execution of it; and having the sagacity to perceive, and strength of mind to confide in, the original and commanding abilities of this self-taught genius, he committed to him the management of the arduous undertaking. Mr. Brindley, from the very first, adopted those leading principles in the projecting of these works, which he afterwards adhered to, and in which he has been imitated by all succeeding artists. To preserve as much as possible the level of his canals, and to avoid the mixture and interference of all natural streams, were objects at which he constantly aimed. To accomplish these, no labour and expense was spared; and his genius seemed to delight in overcoming all obstacles to them by the dis-

covery of new and extraordinary contrivances.

The most experienced engineers upon former systems were amazed and confounded at his projects of aqueduct bridges over navigable rivers, mounds across deep vallies, and subterraneous tunnels; nor could they believe in the practicability of some of these schemes till they saw them effected. In the execution, the ideas he followed were all his own; and the minutest, as well as the greatest, of the expedients he employed, bore the stamp of originality. Every man of genius is an enthusiast. Mr. Brindley was an enthusiast in favour of the superiority of canal navigations above those of rivers; and this triumph of art over nature led him to view with a sort of contempt the winding stream, in which the lover of rural beauty so much delights. This sentiment he is said to have expressed in a striking manner at an examination before a committee of the House of Commons, when on being asked, after he had made some contemptuous remarks relative to rivers, what he conceived they were created for—he answered, “To feed, navigable canals.” A direct rivalry with the navigation of the Irwell and Mersey, was the bold enterprize of his first great canal; and since the success of that design, it has become common all over England to see canals accompanying with insulting parallel the course of navigable rivers.

After the successful execution of the Duke of Bridgewater’s canal to the Mersey, Mr. Brindley was employed in the revived design of carrying a canal from that river to the Trent, through the counties of Chester and Stafford. This undertaking commenced in the year 1766; and from the great ideas it opened to the mind of its conductor, of a scheme

of inland navigation which should connect all the internal parts of England with each other, and with the principal sea ports, by means of *branches* from this main stem, he gave it the emphatical name of the *Grand Trunk*. In executing this, he was called upon to employ all the resources of his invention, on account of the inequality and various nature of the ground to be cut through: in particular, the hill of Harecastle, which was only to be passed by a tunnel of great length, bored through strata of different consistency, and some of them mere quicksand, proved to be a most difficult as well as expensive obstacle, which, however, he completely surmounted. While this was carrying on, a branch from the Grand Trunk to join the Severn near Bewdley was committed to his management, and was finished in 1772. He also executed a canal from Droitwich to the Severn; and he planned the Coventry canal, and for some time superintended its execution, but on account of some difference in opinion, he resigned that office. The Chesterfield canal was the last undertaking of the kind which he conducted, but he only lived to finish some miles of it. There was, however, scarcely any design of canal-navigation set on foot in the kingdom during the latter years of his life in which he was not consulted, and the plan of which he did not either entirely form, or revise and improve. All these it is needless to enumerate, but as an instance of the vastness of his ideas, it may be mentioned, that on planning a canal from Liverpool to join that of the Duke of Bridgewater at Runcorn, it was part of his intention to carry it by an aqueduct bridge across the Mersey, at Runcorn-gap, a place where a tide sometimes rising fourteen feet rushes with great

rapidity through a sudden contraction of the channel. As a mechanic and engineer he was likewise consulted on other occasions; as with respect to the draining of the low-lands in different parts of Lincolnshire and the isle of Ely, and to the cleansing of the docks of Liverpool from mud. He pointed out a method which has been successfully practised, of building sea-walls without mortar; and he was the author of a very ingenious improvement of the machine for drawing water out of mines by the contrivance of a losing and a gaining bucket.

The intensity of application which all his various and complicated employments required, probably shortened his days; as the number of his undertakings, in some degree, impaired his usefulness. He fell into a kind of chronic fever, which, after continuing some years with little intermission, at length wore out his frame, and put a period to his life on September 27th, 1772, in the 56th year of his age. He died at Turnhurst, in Staffordshire, and was buried at New Chapel in the same county.

In appearance and manners, as well as in acquirements, Mr. Brindley was a mere peasant. Unlettered and rude of speech; it was easier for him to devise means for executing a design, than to communicate his ideas concerning it to others. Formed by nature for the profession he assumed, it was there alone that he was in his proper element; and so occupied was his mind with his business, that he was incapable of relaxing in any of the common amusements of life. As he had not the ideas of other men to assist him, whenever a point of difficulty in contrivance occurred, it was his custom to retire to his bed, where in perfect solitude he would

lie for one, two, or three days, pondering the matter in his mind, till the requisite expedient had presented itself. This is that true *inspiration*, which poets have almost exclusively arrogated to themselves, but which men of original genius in every walk of life are actuated by, when from the operation of the mind acting upon itself, without the intrusion of foreign notions, they create and invent. A remarkably retentive memory was one of the essential qualities which Mr. Brindley brought to his mental operations. This enabled him to execute all the parts of the most complex machine in due order, without any help of models or drawings, provided he had once accurately settled the whole plan in his mind. In his calculations of the powers of machines, he followed a plan peculiar to himself; but indeed, the only one he could follow without instruction in the rules of art. He would work the question some time in his head, and then set down the result in figures. Then taking it up in this stage, he would again proceed by a mental operation to another result; and thus he would go on by stages till the whole was finished, only making use of figures to mark the several results of his operations. But though, by the wonderful powers of native genius, he was thus enabled to get over his want of artificial method to a certain degree, yet there is no doubt, when his concerns became extremely complicated, with accounts of various kinds to keep, and calculations of all sorts to form, he could not avoid that perplexity and embarrassment which a readiness in the processes carried on by pen and paper can alone obviate. His estimates of expense have generally proved wild of reality; and he seems to have been better qualified to be the contriver,

than the manager of a great design. His moral qualities were, however, highly respectable. He was far above envy and jealousy, and freely communicated his improvements to persons capable of receiving and executing them; taking a liberal satisfaction in forming a new generation of engineers able to proceed with the great plans in the success of which he was so deeply interested. His integrity and regard to the advantage of his employers were unimpeachable. In fine, the name of *Brindley* will ever keep a place among that small number of mankind, who form *eras* in the art or science to which they devote themselves, by a large and durable extension of their limits.

ACCOUNT OF LAWRENCE EARNSHAW,
ANOTHER SELF-TAUGHT GENIUS, EX-
TRACTED FROM THE GENTLEMAN'S
MAGAZINE, VOL. LVII.

LAWRENCE EARNSHAW was put apprentice when a boy to a taylor, and afterwards to a clothier; but neither of these employments suiting his genius, after serving both for eleven years, he put himself for a short time to a clock-maker, one Shepley, of Stockport. By the force of native abilities, with the very little instruction such an education could give him, he made himself one of the most universal mechanists and artists ever heard of. He could have taken wool from the sheeps' backs, manufactured it into cloth, made that cloth into cloaths, and made every instrument necessary for the clipping, carding, spinning, reeling, weaving, fulling, and dressing, and making it up for wear, with his own hands. He was an engraver, painter, and gilder; he could stain glass and foil mirrors; was a black-smith, white-

smith, copper-smith, gun-smith, bell-founder, and coffin-maker; made and erected sun dials, mended fiddles; repaired, tuned, played upon, and taught, the harpsichord and virginals; made and mended organs, and optical instruments; read and understood Euclid; and in short, had a taste for all sorts of mechanics, and most of the fine arts. Clock-making and repairing was a very favourite employment to him; and he carried so far his theory and practice of clock-work, as to be the inventor of a very curious astronomical and geographical machine, containing the celestial and terrestrial globe, to which different movements were given, representing the diurnal and annual motions of the earth, the position of the moon and stars, the sun's place in the ecliptic, &c. all with the greatest correctness. One of these machines curiously ornamented was sold to the Earl of Bute for £150. All the complicated calculations, as well as the execution of this great work, were performed by himself. He likewise, about 1753, invented a machine to spin and reel cotton at one operation, which he showed to his neighbours and then destroyed, through the generous though mistaken apprehension, that it might take bread from the mouths of the poor. This was previous to all the late inventions of machinery by which the cotton manufactory has been so much promoted. He also contrived a simple and ingenious piece of mechanism for raising water from a coal-mine. He was acquainted with that equally self-taught genius, the celebrated Brindley, and when they occasionally met, they did not soon part. Earnshaw was possessed of an extraordinary degree of sobriety, never drinking a gill of ale for years after he was grown to manhood. His